អ្នកជំនាញខាងជាណកសាស្ត្រឥណ្ឌូចិន
The Indochina Entomologist
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OPEN ACCESS
New Taxa
ICE, 2 (20): 211–219 (2026)
ISSN (Online) 3065-1107
www.indochinaentomologist.com

https://doi.org/10.70590/ice.2026.02.20
http://zoobank.org/urn:lsid:zoobank.org:pub:5FE67226-D210-47FD-9CE1-CAC05A67651B

Two new species of *Poinarinius* Legalov in Cretaceous ambers from Myanmar (Coleoptera: Bostrichidae)

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Abstract: Two new fossil species of auger beetles, *Poinarinius connexus* **sp. nov.** and *P. zhubajie* **sp. nov.**, are described from the Cretaceous amber of Kachin State, northern Myanmar. Illustrations of the new species and morphological comparisons with their congeners are provided.

Keywords: auger beetle, extinct species, fossil, taxonomy

白垩纪缅甸琥珀波氏长蠹属二新种（鞘翅目：长蠹科）

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摘要：基于产自缅甸北部克钦邦的白垩纪琥珀标本，本文描述了两种波氏长蠹属 *Poinarinius* Legalov, 2018 的新种，分别为邻接波氏长蠹 *Poinarinius connexus* **sp. nov.**和猪八戒波氏长蠹 *Poinarinius zhubajie* **sp. nov.**。文中提供了新种的形态特征图示，并将其与同属近似种进行了比较。

关键词：长蠹，灭绝种，化石，分类

Citation: Lin W, Meng L-Z, Zhang Y-F & Xu M-F 2026: Two new species of *Poinarinius* Legalov in Cretaceous ambers from Myanmar (Coleoptera: Bostrichidae). *The Indochina Entomologist*, 2 (20): 211–219. [林伟, 孟令曾, 张毅锋 & 徐淼锋 2026: 白垩纪缅甸琥珀波氏长蠹属二新种（鞘翅目：长蠹科）. 中南半岛昆虫学家, 2 (20): 211–219.]
https://doi.org/10.70590/ice.2026.02.20

Accepted by Cheng-Bin WANG: 1.IV.2026; published online: 13.IV.2026

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Introduction

The beetle family Bostrichidae (auger beetles) is a small but diverse group, with approximately 600 known species worldwide (Zahradník & Háva 2024). Although widely distributed, they are primarily found in arid and tropical regions (Ivie 2010; Liu 2021). To date, 25 fossil species of Bostrichidae have been discovered worldwide. 17 of which have been recently described from Myanmar amber (Zahradník & Háva 2024; Háva & Zahradník 2025). Within the subfamily Alitrepaninae, 13 species are known exclusively from Myanmar amber, all belonging to the genus *Poinarinius* Legalov, 2018 (Legalov 2018; Legalov & Háva 2022; Peng *et al.* 2022; Háva & Legalov 2023ab; Wang *et al.* 2025).

Here we describe two additional mid-Cretaceous species of *Poinarinius* from Hukawng Valley (Kachin state), northern Myanmar.

Material and methods

Total body length was measured from the anterior margin of head to the elytral apices, and width at the widest point of the elytra. Pronotal length was measured from the midline and width from the widest point. All measurements are estimations, as body parts may be deformed depending on their orientation within the amber.

Images (Figs 1A, 2A, 3) were taken by a Canon EOS 800D (Canon, Japan) with a Tamron 90mm f2.8 Macro lens (Tamron, Japan). Other images were taken using a Leica Dvm6A (Leica, Germany).

Abbreviations for collections in this study are:

LW—Wei Lin's private collection, Zhuhai, China.

NACRC—National Animal Collection Resource Center, Beijing, China.

NIGP—Nanjing Institute of Geology and Palaeontology, Chinese Academy of Sciences, Nanjing, China.

ZYF—Yi-Feng Zhang's private collection, Fuzhou, China.

Taxonomy

Family Bostrichidae Latreille, 1802
Subfamily Alitrepaninae Peng, Jiang, Engel & Wang, 2022
Genus *Poinarinius* Legalov, 2018

Type species. *Poinarinius burmaensis* Legalov, 2018: 211.

Poinarinius connexus sp. nov. 邻接波氏长蠹

https://zoobank.org/B17E36D4-ECED-4D58-8EAB-84D357CC90A4

Fig. 1

Locality and horizon. Amber originating from the Hukaweng Valley in Kachin State, northern Myanmar, dates back to the lowest Cenozoic period, during the Middle Cretaceous (Shi *et al*. 2012).

Type material. Holotype: Numbered LWHP202504 (LW) (Sex unknown). The specimen is complete, with all body parts preserved in a transparent amber piece. Syninclusions consist of numerous small to minute organic particles (Fig. 1A).

Diagnosis. This species is distinguished from other species of *Poinarinius* by the frons with a short transverse ridge and two tubercles; elytral bases punctures very large and coarse; elytral interstriae 2 punctate and interstriae 3/5/7/9 costae; declivity deep and declivital summit armed with a large transverse lobe from interstriae 3 to interstriae 5, and then extend longitudinally to basal 2/3 of declivity, the inside apex of the transverse lobe acute and pointed to suture; and protarsi 1.2× as long as protibiae.

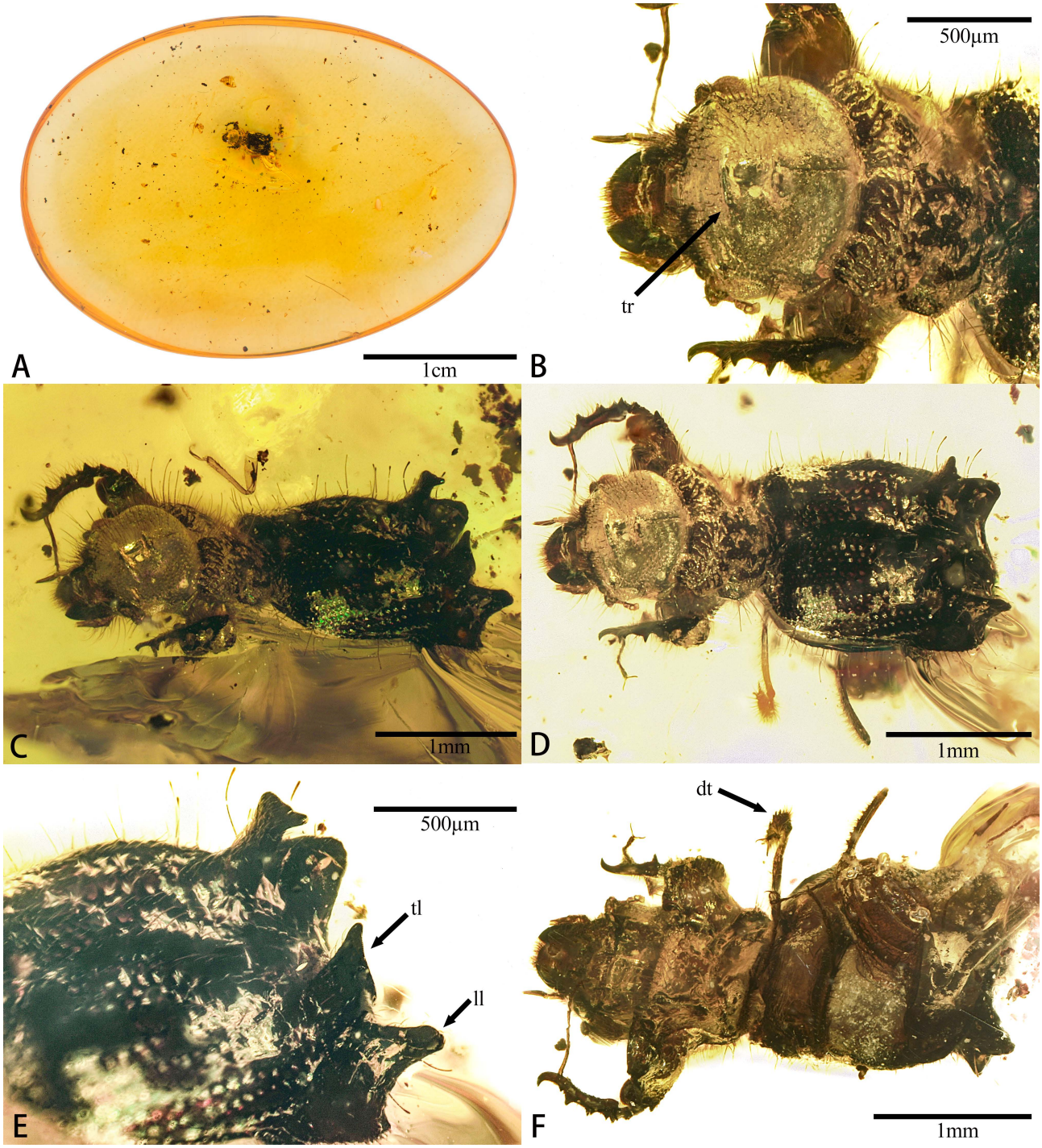

FIGURE 1. Holotype of *Poinarinius connexus* **sp. nov.**: **A** amber piece **B** dorsolateral view (part) **C, D** dorsolateral view **E**declivity **F** ventral view. Abbreviations: dt, denticles; ll, longitudinal lobe; tl, transverse lobe; tr, transverse ridge.

Poinarinius connexus **sp. nov.** resembles *P. burmaensis* Legalov, 2018 but differs in two key features: (1) frons densely punctate without rugosities (*P. connexus*) versus sparsely punctate with transverse rugosities (*P. burmaensis*); (2) elytral declivity with a large transverse lobe at the summit (*P. connexus*) versus with no transverse lobe (*P. burmaensis*) (Legalov 2018).

This species is also similar to *Poinarinius lesnei* Legalov & Háva, 2022 but can be differentiated by the elytral declivity (declivital summit armed with a large transverse lobe from interstriae 3 to interstriae 5, and then extend longitudinally to basal 2/3 of declivity, while declivital summit of *P. lesnei* without a longitudinal lobe) (Legalov &

Háva 2022).

Description. 3.0mm long; 2.4× as long as wide. Body subcylindrical, dark brown. **Head:** mandibles moderately long, without projection on base. labrum semi-circular, beyond 1/2 of mandibles, with abundant hair-like setae. Frons flat, convex in middle and depressed on upper middle side; punctate; punctures dense and small, with long erect hair-like setae; costae at basal 1/4, with a short transverse ridge; armed with two tubercles at basal 3/5; vertex with a shallow longitudinal groove. Eyes convex, oval. Antennal club wider than long, with three transverse antennomeres. **Pronotum:** 0.7× as long as wide, widest at middle, narrowest at base; cover with long erect hair-like setae; the apex slightly narrower than head; anterior margin concave and with longitudinal rugosities; disc convex, punctate; punctures small; strongly depressed at middle sides; lateral margins weak carinate. **Elytra:** 1.28× as long as wide, 2.29× as long as pronotum. Elytral bases punctures very large, coarse; sides subparallel in basal 4/5, then narrowing at basal 1/5 to apex. Disc convex, striae punctate, punctures very large and deep, separated by about 0.5–1.5× their diameter; sutural margin costae; interstriae 2 as wide as striae 1, punctate, punctures smaller than striae 1; interstriae 3/5/7/9 costae, as wide as adjacent striae; sides of elytra with erect setae. Declivity deep, occupying approximately 1/3 of elytral length; declivital summit armed with a large transverse lobe from interstriae 3 to interstriae 5, and then extend longitudinally to basal 2/3 of declivity, the inside apex of the transverse lobe acute and pointed to suture, the apex of transverse lobe taller than the longitudinal one. Posterolateral margin of elytra weakly serrated. **Legs:** procoxae widely separated. Profemur strongly inflated. Protibiae robust, outer margin with a deep groove, divides into upper and lower parts, armed by 4–5 triangular, pointed, and unequal teeth on each part, a large spine at apex backwardly pointed. Protarsi 1.2× as long as protibiae, ratio of protarsomeres 1–5 lengths are approximately: 1:0.65:0.5:0.3:0.7; tarsal claws armed with a small denticle at basal 1/3. Mesotibiae flattened, with two apical spurs; outer margins with several small denticles; ratio of mesotarsomeres 1–5 lengths are approximately: 1:0.53:0.5:0.35:0.88. Metatibiae flattened, with two apical spurs; outer margins with several small denticles; ratio of metatarsomeres 1–5 lengths are approximately: 1:0.5:0.4:0.25:0.75.

Etymology. The name "*connexus*" is an adjective meaning connected. In reference to the connected lobes on declivity.

Poinarinius zhubajie sp. nov. 猪八戒波氏长蠹

https://zoobank.org/86A50EA6-6D9E-4DC8-9C02-7608881A41F2

Fig. 2

Locality and horizon. Amber originating from the Hukaweng Valley in Kachin State, northern Myanmar, dates back to the lowest Cenozoic period, during the Middle Cretaceous (Shi *et al*. 2012).

Type material. Holotype: Numbered LWHP202502 (LW) (Sex unknown). The specimen is complete, with all body parts preserved in a transparent amber piece. Syninclusions: Two *Poinarinius* sp., one *P.* aff. *burmaensis* Legalov, 2018, one Hemiptera, and numerous small to minute organic particles (Fig. 2A). **Paratype**: Numbered IOZ(E)224807 (NACRC) (Sex unknown). Same condition with Holotype. Syninclusions: One Arachnida and numerous small organic particles (Fig. 3A); Numbered NIGP209151 (NIGP) (Sex unknown). Same condition with Holotype. Syninclusions consist of numerous small to minute organic particles. (Fig. 3B); Numbered 3BM60 (ZYF) (Sex unknown). Same condition with Holotype. Syninclusions consist of numerous big organic particles (Fig. 3C); Numbered 3BM42-3BM44 (ZYF) (Sex unknown). Same condition with Holotype. Syninclusions: Four *Poinarinius* sp., one *Elongatus kachinus* Wang, Lin & Wang, 2024, one Diptera, one Reduviidae and some other beetles (Fig. 3D).

Diagnosis. This species is distinguished from other species of *Poinarinius* by the frons with a short longitudinal ridge; mandibles with a large triangular projection on each basal 1/2; pronotum strongly depressed at the basal of pronotum; elytral disc convex; striae not impressed, uniseriately punctate; interstriae uniseriately punctate with punctures smaller than those on striae. Declivity occupying approximately 1/3 of elytral length; declivital slope very gentle.

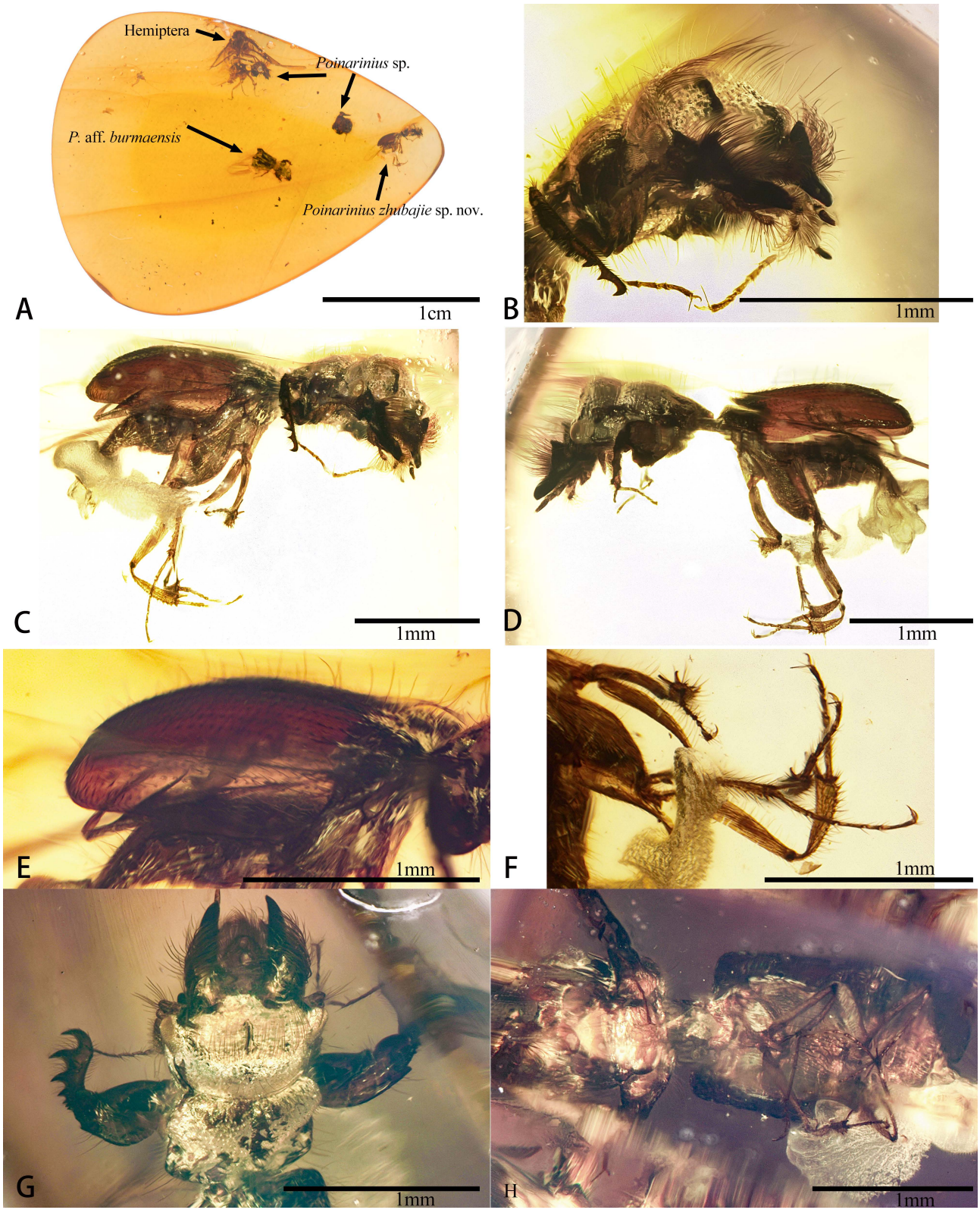

FIGURE 2. Holotype of *Poinarinius zhubajie* **sp. nov.**: **A** amber piece **B** lateral view (head) **C**, **D** lateral view **E** lateral view (elytra) **F** lateral view (legs) **G** dorsal view (part) **H** ventral view.

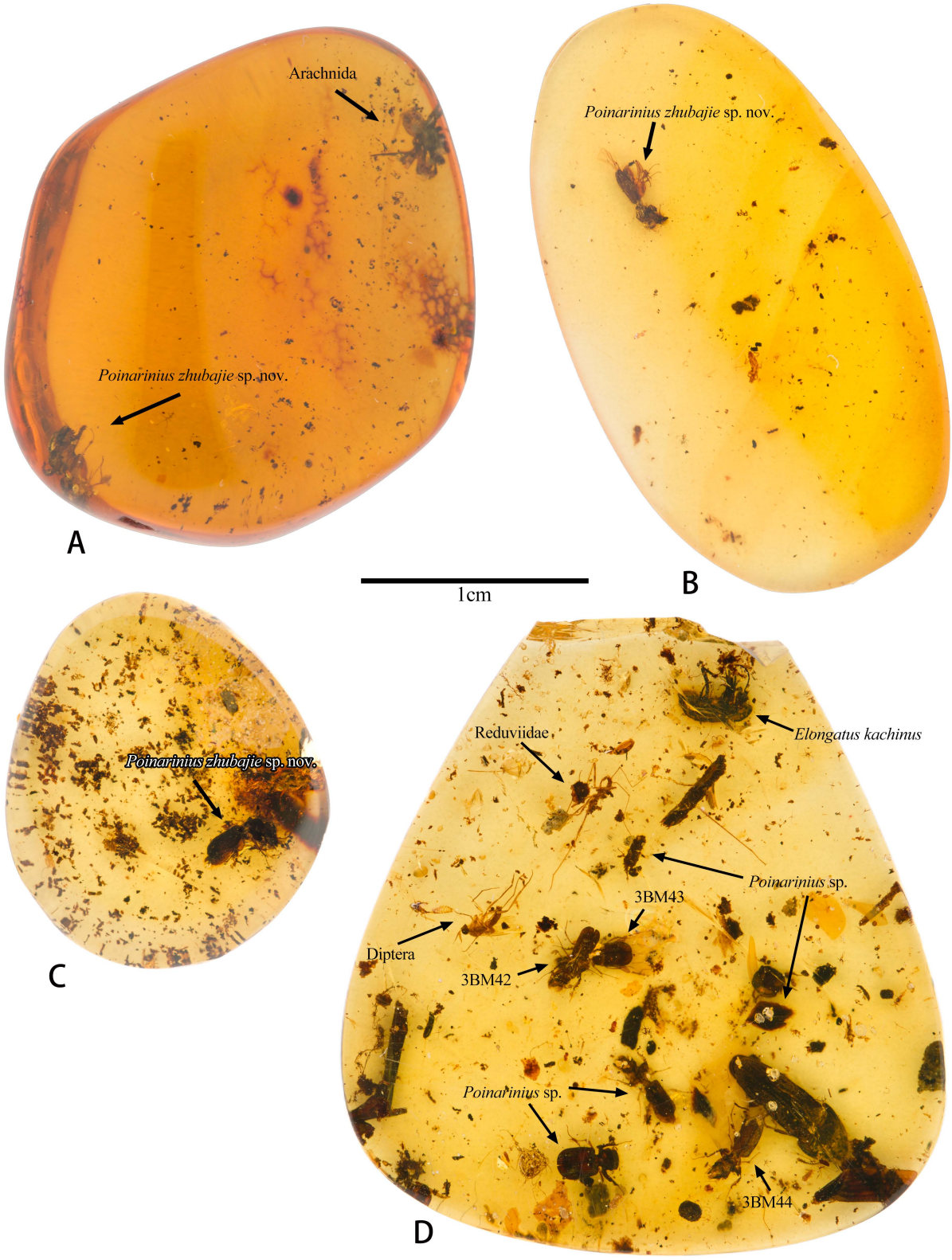

FIGURE 3. Paratype of *Poinarinius zhubajie* **sp. nov.**: **A-D** amber piece. **A** Numbered IOZ(E)224807 (NACRC) **B** Numbered NIGP209151 (NIGP) **C** Numbered 3BM60 (ZYF) **D** Numbered 3BM42-3BM44 (ZYF).

Poinarinius zhubajie resembles *P. vetus* Wang, Peng & Wang, 2024, *P. antonkozlovi* Legalov & Háva, 2022 and *P. aristovi* Legalov & Háva, 2022 but can be differentiated by the following characteristics: pronotum without rugosities, large triangular projection on mandibles and smooth elytra (Legalov & Háva 2022).

Description. 2.3mm long; 2.8× as long as wide. Body subcylindrical, brown. **Head:** mandibles very long (0.5mm), with a large triangular projection on each basal 1/2; the projection with long erect hair-like setae curving towards the middle of the mandibles, and the base of mandibles glabrous. labrum tongue-shaped, beyond 1/2 of mandibles, with abundant hair-like setae. Frons slightly concave, coarse, punctate, setose; with a short longitudinal ridge on upper part; the lateral and upper margins with longer, erect, hairlike setae. Eyes convex. Antennal club wider than long, with three transverse antennomeres. **Pronotum:** 0.94× as long as wide; cover with long erect hair-like setae; the apex slightly narrower than head; disc convex, punctate; punctures small, with long erect hair-like setae; strongly depressed at middle sides and basal of pronotum; lateral margins carinate. **Elytra:** 1.63× as long as wide, 1.88× as long as pronotum, covered with dense short semi-erect, hair-like setae and sparse long erect, hair-like setae. Disc convex, striae not impressed, uniseriate punctate, punctures very small, separated by about 2–3× their diameter, with erect hair-like setae; interstriae uniseriate punctate, punctures smaller than on striae, separated by about 4–6× their diameter. Declivity occupying approximately 1/3 of elytral length; declivital slope very gentle. **Legs:** procoxae widely separated. Profemur strongly inflated. Protibiae robust, outer margin with a deep groove, divides into upper and lower parts, armed by triangular, pointed, and unequal teeth on each part, a large spine at apex backwardly pointed. Protarsi 0.75× as long as protibiae, protarsomere 1 long, approximately equal to the sum of protarsomeres 2 and 3 and 4; tarsal claws armed with a small denticle at basal 1/3. Mesotibiae flattened, with two unequal apical spurs, the longer one approximately equal in length to the first metatarsomere; outer margins with five small denticles; ratio of mesotarsomeres 1–5 lengths are approximately: 1:0.5:0.6:0.3:0.7. Metatibiae flattened, with two unequal apical spurs; outer margins with several smaller denticles than on metatibiae; ratio of metatarsomeres 1–5 lengths are approximately: 1:0.4:0.4:0.3:0.6.

Etymology. This new species is named after 'Zhubajie' (used as an appositive noun), a Chinese mythical figure who with long fangs, corresponding to the strong mandibles of this species.

Discussion

The genus *Poinarinius* was thoroughly reviewed by Legalov & Háva (2022). Based on the new species described herein, we provide the following provisional supplements to the generic diagnosis, which may further characterize the genus: mesotibial spurs equal or unequal in length; pronotum strongly depressed at middle sides.

Many characteristics of *Poinarinius* spp. are strikingly similar to those of the extant species of *Scolytoplatypus* spp. (Curculionidae: Scolytinae), including their cylindrical shape, resemblance to the frons, widely spaced procoxae, and comparable spiny protibiae (Fig. 4). We speculate that *Scolytoplatypus* spp. and *Poinarinius* spp. may have a similar diet, which are ambrosia beetles and breed in a wide variety of trees (Beaver & Gebhardt 2006). Similar features might have been developed via convergent evolution.

Two different types of frons are discovered in *Poinarinius*: one is conspicuously convex, while the other is concave and with long hairlike setae on margins, which are frequently accompanied by robust, setose mandibles. In *Scolytoplatypus*, such frons are characterized by fixed sexual traits: males have concave frons, while females have convex frons. However, additional research is needed to understand whether varied frons of the genus *Poinarinius* reflect different sexual distinctions.

Since the description of the type species (Legalov 2018), *Poinarinius* has exhibited extraordinary diversity, with 15 species (including the two described herein) have been described within less than a decade. Notably, amber specimens from this genus are exceptionally abundant. Observations from the authors' additional collections and published literature (Peng *et al.* 2022; Háva & Legalov 2023b) reveal aggregation behavior, with multiple individuals of different species frequently clustered together in the same amber piece. Accordingly, we hypothesize

that, similar to many extant bark beetles, this genus may produce aggregation pheromones.

Notably, among the currently described fossil taxa of Bostrichidae, the Cretaceous (Mesozoic) subfamily Alitrepaninae exhibits significant morphological divergence from extant groups, while the Paleogene (Cenozoic) fossil taxa of Bostrichidae show minimal morphological differences from extant lineages. Whether Alitrepaninae represents the ancestral lineage of Bostrichidae or is assigned to the family due to superficial morphological similarities with extant groups requires further evidence for validation.

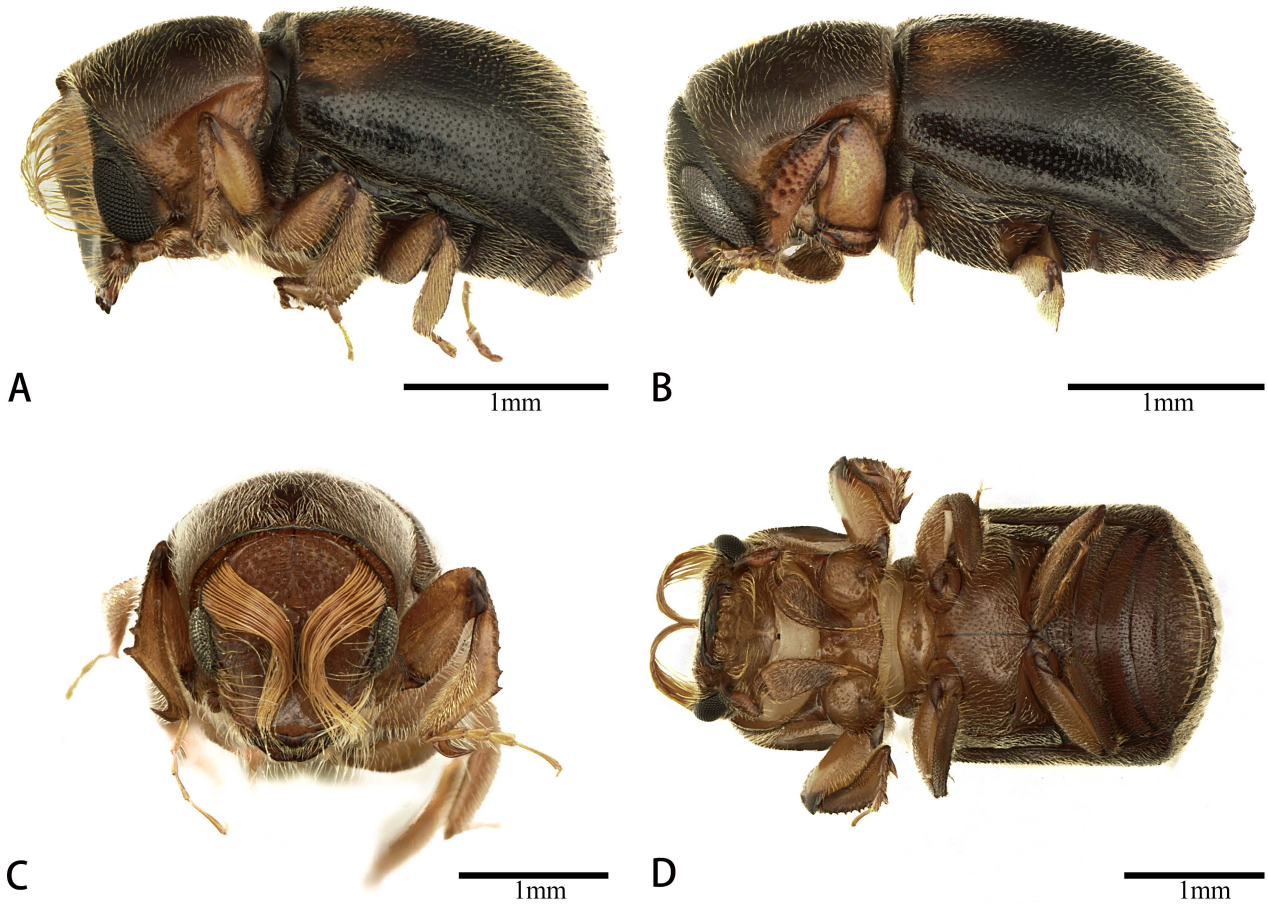

FIGURE 4. Habitus of *Scolytoplatypus* spp.: **A** lateral view of *S. blandfordi*, male **B** lateral view of *S. blandfordi*, female **C** *S. wugongshanensis* (front view, show head and protibiae), male **D** ventral view of *S. wugongshanensis*, male.

Acknowledgements

We are very grateful to Dr. Ri-Xin Jiang (Guiyang, China) provided useful literatures.

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Additional information

Author contributions: Writing, Visualization, Editing: W Lin, L-Z Meng and Y-F Zhang. Writing review: M-F Xu.

Conflict of interest: The authors have declared that no competing interests exist.

Data availability: All the data that support the findings of this study are available in the main text.

Ethical statement: No ethical statement was reported.

Funding: This study was self-funded by the authors.

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Photo Gallery

Mesosa hyunchaei Yamasako & Hasegawa, 2009
Maoshan [茅山], Jintan [金坛], Changzhou City, Jiangsu Province
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